



BW

PTO/SB/21 (02-04)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

		Application Number	10/710,452
		Filing Date	07/13/2004
		First Named Inventor	Jeng-Wei Yang
		Art Unit	
		Examiner Name	
Total Number of Pages in This Submission	15	Attorney Docket Number	NAUP0470USA1

ENCLOSURES (Check all that apply)

<input checked="" type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input checked="" type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/ Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <input type="checkbox"/> Remarks	<input type="checkbox"/> After Allowance communication to Technology Center (TC) <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input type="checkbox"/> Other Enclosure(s) (please identify below):
--	--	--

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Winston Hsu, Reg. No.: 41,526
Signature	<i>Winston Hsu</i>
Date	8/18/2004

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.

Typed or printed name		
Signature		Date

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

 Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ 0.00)

Complete if Known

Application Number	10/710,452
Filing Date	07/13/2004
First Named Inventor	Jeng-Wei Yang
Examiner Name	
Art Unit	
Attorney Docket No.	NAUP0470USA1

METHOD OF PAYMENT (check all that apply)

 Check Credit card Money Order Other None
 Deposit Account:

Deposit Account Number 50-3105
 Deposit Account Name North America Intellectual Property Corp.

The Director is authorized to: (check all that apply)

- Charge fee(s) indicated below Credit any overpayments
 Charge any additional fee(s) or any underpayment of fee(s)
 Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1001 770	2001 385	Utility filing fee	
1002 340	2002 170	Design filing fee	
1003 530	2003 265	Plant filing fee	
1004 770	2004 385	Reissue filing fee	
1005 160	2005 80	Provisional filing fee	
SUBTOTAL (1)		(\$ 0.00)	

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	Independent Claims	Multiple Dependent	Extra Claims	Fee from below	Fee Paid
			-20** =	X	=
			- 3** =	X	=

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
1202 18	2202 9	Claims in excess of 20
1201 86	2201 43	Independent claims in excess of 3
1203 290	2203 145	Multiple dependent claim, if not paid
1204 86	2204 43	** Reissue independent claims over original patent
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent
SUBTOTAL (2)		(\$ 0.00)

**or number previously paid, if greater; For Reissues, see above

3. ADDITIONAL FEES

Large Entity Small Entity

Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 50	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	1053 130	Non-English specification	
1812 2,520	1812 2,520	For filing a request for ex parte reexamination	
1804 920*	1804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	
1252 420	2252 210	Extension for reply within second month	
1253 950	2253 475	Extension for reply within third month	
1254 1,480	2254 740	Extension for reply within fourth month	
1255 2,010	2255 1,005	Extension for reply within fifth month	
1401 330	2401 165	Notice of Appeal	
1402 330	2402 165	Filing a brief in support of an appeal	
1403 290	2403 145	Request for oral hearing	
1451 1,510	1451 1,510	Petition to institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,330	2453 665	Petition to revive - unintentional	
1501 1,330	2501 665	Utility issue fee (or reissue)	
1502 480	2502 240	Design issue fee	
1503 640	2503 320	Plant issue fee	
1460 130	1460 130	Petitions to the Commissioner	
1807 50	1807 50	Processing fee under 37 CFR 1.17(q)	
1806 180	1806 180	Submission of Information Disclosure Stmt	
8021 40	8021 40	Recording each patent assignment per property (times number of properties)	
1809 770	2809 385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810 770	2810 385	For each additional invention to be examined (37 CFR 1.129(b))	
1801 770	2801 385	Request for Continued Examination (RCE)	
1802 900	1802 900	Request for expedited examination of a design application	

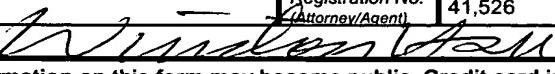
Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$ 0.00)

(Complete if applicable)

SUBMITTED BY

Name (Print/Type)	Winston Hsu	Registration No. (Attorney/Agent)	41,526	Telephone	886289237350
Signature			Date	8/18/2004	

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Jeng-Wei Yang and Tse-Yuan Lo

5 Filing Date: 7/13/2004

Serial No.: 10/710,452

Docket No.: NAUP0470USA1

Title: CLEANING COMPOSITION AND METHOD OF WASHING A
10 SILICON WAFER

To: Commissioner for Patents

P.O. BOX 1450

Alexandria, VA 22313-1450

15

Subject: Information disclosure statement under 37C.F.R. § 1.56.

Dear Sir:

20 This is an Information Disclosure Statement in accordance with the duty to disclose information material to patentability under 37 C.F.R. §1.56. The applicant wishes to make of record the document listed on the accompanying form 1449A/PTO. It is respectfully requested that the examiner initials the cited reference on the form and that it be made of record in the application and that a copy of the 25 initialed form be sent to the applicant with the next communication from the examiner.

Since the IDS is filed before the mailing date of a first Office action on the merits, a petition to request consideration of the information disclosure statement is hereby requested according to 37 CFR §1.97(b). To comply with 37 C.F.R. §1.97(e), which 30 states that each item of information contained in the information disclosure statement was first cited in any communications from a foreign application not more than three months prior to the filing of the information disclosure statement, each item of

information contained in the information disclosure statement was first cited in the communication from the State Intellectual Property Office of People's Republic of China on June 25, 2004 for a counterpart foreign application. The applicant sincerely hopes that the examiner can consider the items contained in this IDS.

5

According to the requirement set forth in 37 C.F.R. §1.98 and M.P.E.P. 609, the applicants are submitting a copy of the cited reference (China Patent No. 1227279A) and a concise explanation of the relevance in this application hereinafter.

10 The objective of CN 1227279A (equivalent to US 6,630,074 B1) is to provide an etchant composition that is effective in removing polymer and via residue from a substrate or conductive material, and especially from an integrated circuit chip having aluminum lines thereon. The etchant composition of the prior art includes an aqueous solution containing about 0.01 to about 15 percent by weight of sulfuric acid,
15 about 0.01 to about 20 percent by weight of hydrogen peroxide, or about 1 to about 30 ppm of ozone, and about 0.1 to about 100 ppm of hydrofluoric acid.

According to the claimed invention of the present application, a cleaning composition comprises a first acid for removing copper from the silicon wafer surface,
20 an oxidizing agent for oxidizing the silicon wafer surface to form an oxide thin film and for oxidizing barrier residues on the bevel edges, a second acid for removing the oxide thin film and the oxidized barrier residue, and deionized (DI) water. The first acid is selected from a group consisting of H₂SO₄, HNO₃, CH₃COOH, and H₃PO₄; the oxidizing agent is selected from H₂O₂ or HNO₃; and the second acid is HF. The compositions are as follows: the first acid is present in an amount between 10% to
25 15% by weight; the oxidizing agent is present in an amount between 30% to 35% by weight; and the second acid is present in an amount between 0.5% to 1.0% by weight.

It is an advantage of the present application that the cleaning composition is
30 capable of dissolving copper on the surface of the wafer and removing copper, which penetrates into the surface layer of the wafer. Furthermore, the mixture is also capable of removing copper and TaN on the bevel edges of the wafer to overcome the

prior art shortcomings.

For convenience, the original claims 1 to 6 of the present application are listed below:

5

Claim 1: A cleaning composition for washing a silicon wafer surface comprising a backside surface and bevel edges, the cleaning composition comprising:

a first acid for removing copper from the silicon wafer surface;
an oxidizing agent for oxidizing the silicon wafer surface to form an oxide thin
10 film and for oxidizing barrier residue on the bevel edges;
a second acid for removing the oxide thin film and the oxidized barrier residue;
and
deionized (DI) water.

15 Claim 2: The cleaning composition of claim 1 wherein the first acid is selected from a group consisting of H₂SO₄, HNO₃, CH₃COOH, and H₃PO₄.

Claim 3: The cleaning composition of claim 1 wherein the oxidizing agent is selected from H₂O₂ or HNO₃.

20

Claim 4: The cleaning composition of claim 1 wherein the second acid is HF.

Claim 5: The cleaning composition of claim 1 wherein the first acid is present in an amount between 10% to 15% by weight; the oxidizing agent is present in an amount
25 between 30% to 35% by weight; and the second acid is present in an amount between 0.5% to 1.0% by weight.

Claim 6: The cleaning composition of claim 1 wherein the barrier residue comprises of either TiN or TaN.

30

Despite the fact that the prior art patent cited above has disclosed an etchant composition relatively similar in content with the cleaning composition disclosed in

the present application, the cleaning purpose, target, and concentration between the two compositions however, are significantly different. Essentially, the main target of the present application is copper whereas the target of prior art patent cited above is aluminum. In addition, the concentrations of the etchant composition disclosed in 5 the prior art patent are also considerably lower than the concentrations disclosed in the present application. It is therefore believed that the claimed invention of the present application is substantially different from the prior art patent CN 1227279A.

10 Respectfully Submitted,



Date: 8/8/2004

15 Winston Hsu, Patent Agent No. 41,526

P.O. BOX 506

Merrifield, VA 22116

U.S.A.

e-mail : winstonhsu@naipo.com.tw

20 (Please contact me by e-mail if you need a telephone communication and I will return your call promptly)



Complete if Known

PTO/SB/08A (08-03)
47 CFR 1.417(b) - 07/31/2006 QMB 0651-0031

Approved for use through 07/31/2006. OMB 0891-0031
U.S. Office of U.S. DEPARTMENT OF COMMERCE

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
OMB Control Number: 2055-0002. This form is subject to change unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	10/710,452
Filing Date	07/13/2004
First Named Inventor	Jeng-Wei Yang
Art Unit	
Examiner Name	
Attorney Docket Number	NAUP0470USA1

U.S. PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS

***EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. **1** Applicant's unique citation designation number (optional). **2** See Kind Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. **3** Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). **4** For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. **5** Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. **6** Applicant is to place a check mark here if English language translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND ALL COMMENTS AND SUGGESTIONS TO: U.S. PATENT AND TRADEMARK OFFICE, 1100 DEADERICK ST., ALEXANDRIA, VA 22313-1450.

TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.
Call the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.